# Intermission

Coming Up

Training Session #3 – Assimilative Capacity

# Training Session 3: Powder River Assimilative Capacity

WYPDES Primary Contacts:

- Kathy Shreve
- Bill DiRienzo

Visit our website:

http://deq.state.wy.us/wqd/WYPDES_Permitting/WYPDES_cbm/assimcap.htm

# Overview

- Assimilative Capacity Policy Review
- Registration Requirements
- Assimilative Capacity Credit Allocations
- Direct Discharge Permits utilizing Assimilative Capacity Credits
- Reservoir Releases
- Assimilative Capacity Credit Transfers
- Quiz, Questions and Comments

# Powder River Assimilative Capacity Policy

- Statement of Policy
  - Objective: Establish a mechanism within the WYPDES regulatory framework to allow discharges of CBM produced water to the Powder River mainstem and tributaries while providing the greatest level of assurance that the Wyoming and Montana standards for TDS and SAR are protected.
  - "Constituents of concern"
    - Sodium
    - TDS

# How much is out there?

Modeled Total Average Powder River Sodium and TDS Loads on a Monthly Basis. Then calculated the amount of additional Sodium and TDS that could be added to the Powder River without exceeding limitations adopted by the state of Montana. Monthly limitations necessary due to the high degree of water quality variability within the Powder River drainage.

# Who needs Assimilative Capacity Credits?

On-channel dischargers in the Powder River Basin (including tributaries), whose discharge can't meet background Powder River TDS and sodium concentrations, AND who can't contain all of their discharge in reservoirs. This includes direct discharge to channels, draw-down releases from reservoirs, reservoirs that overtop even without rain, or reservoirs that have flowing seeps.

# Who doesn't need Assimilative Capacity Credits?

- Operators outside of the Powder River Basin
- Operators whose discharge meets background concentrations for TDS and sodium in the Powder River
- Operators who can contain all of their discharge in reservoirs. Containment for assimilative capacity purposes does not have to be 50-yr/24-hr containment. Reservoirs can be kept full, and overtop with any rain.

# How do I get my hands on some of that Powder River Assimilative Capacity?

Registration Requirements:

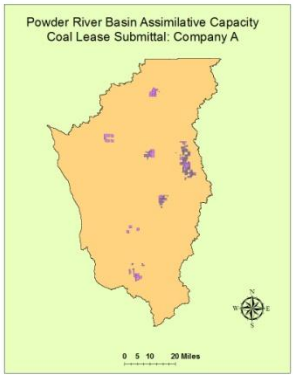
- Download registration requirements document from the Assimilative Capacity website
- *"Based upon reasonable investigation…"*
- Submit a shapefile
  - Leases owned or operated by the submitting company
  - NAD 83 UTM Zone 13 projection
  - Required attributes

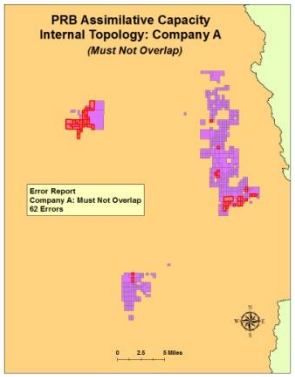
# Shapefile Attributes – Required!

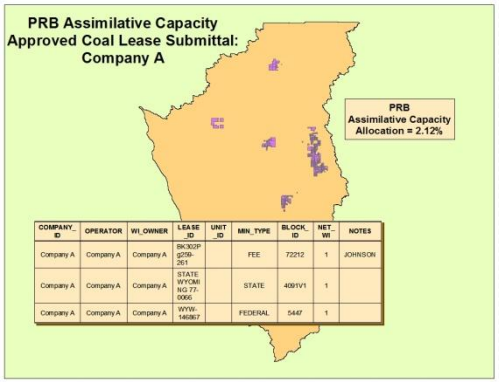
**Table 1:** Shapefile Attribute Table Template

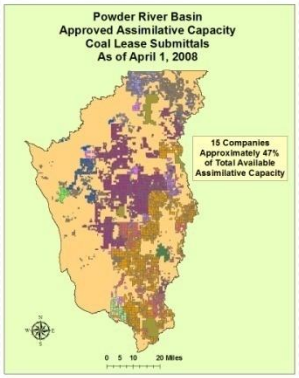
| *Text* | *Text* | *Text* | *Text* | *Text* | *Text* | *Text* | *Numeric/Double* | *Text* |
|---|---|---|---|---|---|---|---|---|
| **Company_ID** | **Operator** | **WI_Owner** | **Lease_ID** | **Unit_ID** | **Min_Type** | **Block_ID** | **Net_WI** | **Notes** |
| | | Acme Inc. | XYZ-100 | Acme Federal | Federal | 1 | 0.75 | PDQ Inc. 25% Net WI |
| | | PDQ Inc. | XYZ-100 | Acme Federal | Federal | 1 | 0.25 | |
| | | Acme Inc. | XYZ-100 | Acme Federal | Federal | 2 | 0.80 | ABC Inc. 20% Net WI |
| | | Acme Inc. | XYZ-100 | Acme Federal | Federal | 3 | 1 | |
| | | Acme Inc. | XYZ-100 | Acme Federal | Federal | 4 | 1 | |
| | | Acme Inc. | XYZ-100 | Acme Federal | Federal | 5 | 1 | |
| | Acme Inc. | | BK27Pg126 | | Fee | 6 | 1 | Carbon Co. |

# Submitting Your Shapefile



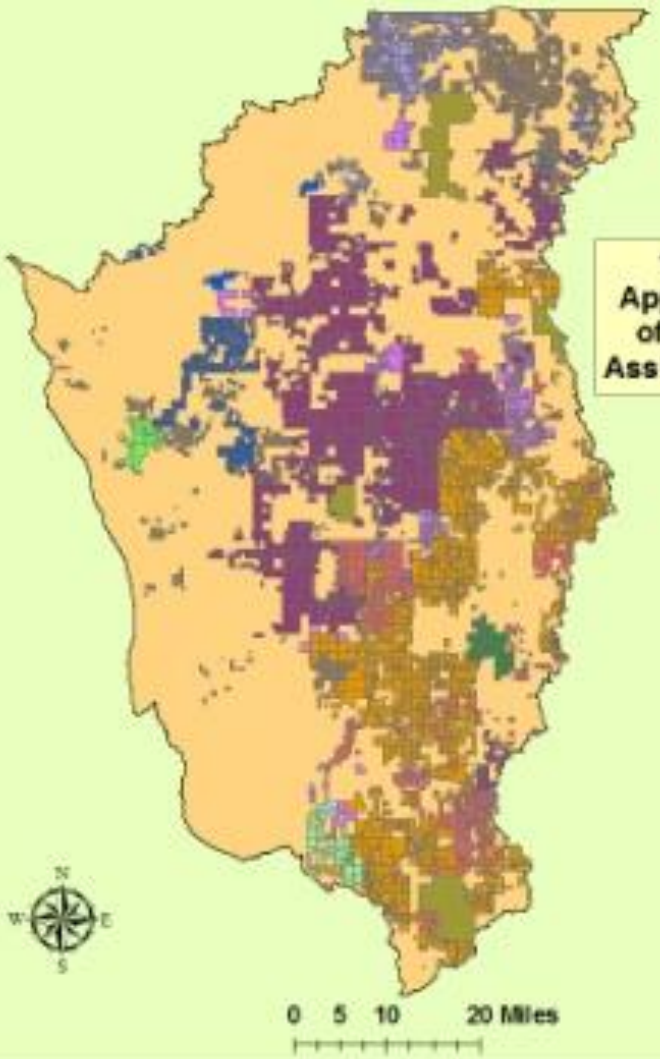



PRB Assi
Approved Co
Co

| COMPANY_ ID | OPI |
|---|---|
| Company A | Co |
| Company A | Co |
| Company A | Co |

## Powder River Basin
## Approved Assimilative Capacity
## Coal Lease Submittals
## As of April 1, 2008




RB
ive Capacity
on = 2.12%

# Incomplete / Rejected Submittals and Conflict Resolution

- Incomplete/Rejected Submittals
  - Add/Remove and/or Correct Data and Resubmit
    - Hardcopy
    - E-mail
- Internal Conflicts
  - Correct and resubmit shapefile
- External Conflicts
  - First Come – First Serve
  - Resolve and Document
  - DEQ's role

# Allocations

**Based on total available assimilative capacity, and *net working interest* (percent of total Powder River coal resource leased by company)**

# Assimilative Capacity Use in WYPDES Direct Discharge CBM Permits

- Table 6 in Revised Application
- Assimilative Capacity "Locked In" for direct discharges
  - Be conservative
- Effluent Limit is Total Monthly Load
- Monthly DMRs required for direct discharges
- Permit Language /Reservoir Releases
- Use of Reservoir Releases may the trumped by Ag Protection!

# Assimilative Capacity Usage Formula

$$[(V \times C_{di}) - (V \times C_{pr})] \times D_{tot} \times 8.34\ (lb/MG)/(mg/l) = \textbf{Assimilative Capacity Unit Usage}$$

**WHERE:**

**V** = volume, in million gallons per day (MGD), discharged from the reservoir for the given month

$\mathbf{C_{di}}$ = concentration, in mg/l, of TDS or dissolved sodium in the discharge

$\mathbf{C_{pr}}$ = average ambient Powder River concentration of TDS or dissolved sodium, in mg/l, for the month during which discharge will occur (ambient concentration values have been pre-determined by the WDEQ using USGS water quality data)

$\mathbf{D_{tot}}$ = reservoir release duration, in days

**8.34 (lb/MG)/(mg/l)** is a conversion factor to convert mg to pounds in the equation

**Assimilative Capacity Unit Usage** = the number of assimilative capacity units to be utilized by the reservoir release during a given month (1 unit = 1 pound of TDS or dissolved sodium)

# Reservoir Releases

- Download Form from AC Web Page
- Requests
  - Submit at least 14 days prior to release
  - Water quality samples no more than 45 days prior to request submittal / 60 days prior to release
  - One-time release not to exceed 7 days
  - Associated permit must allow planned discharges
  - SAR/EC Limits
  - Use of reservoir releases may be trumped by agricultural use protections in drainage
- Approvals
- Reports
  - Submitted within 30 days from completion date
  - Volume only

Too much?

Not enough?

# Assimilative Capacity Credit Transfers and Sales

- A Free Market System
- Documentations and Signatures Required from Both Parties
- DEQ's Role

# AC Quiz

**Some time during February, your company, Gas X, would like to release water from Reservoir A, located *On-Channel* in Happy Draw, a tributary to the Powder River. There is no downstream irrigation. Gas X has been allocated AC credits based on a 0.1283% Net Working Interest in PRB Coal. The lab report indicates that the reservoir would discharge water with a dissolved sodium concentration of 1040 mg/l and a TDS concentration of 2630 mg/l. The release is planned to take place over a 7 day period at a flow rate of 0.22 MGD. Assuming all submittal requirements are complete and correct, would this release be allowable under the Powder River Assimilative Capacity Policy?**

Total Available February Assimilative Capacity:

TDS = 127,100,639 lbs; Dissolved Na = 7,489,232 lbs

February Ambient Powder River Concentration:

TDS = 1,444 mg/l; Dissolved Na = 194 mg/l

# Quiz Solution

For the month of February, Gas X's total assimilative capacity allotment is calculated as follows:

.001283 X 127,100,639 = 163,070 lbs TDS

.001283 X 7,489,232 = 9,608 lbs dissolved Na

Proposed Release assimilative capacity load is calculated as follows:

(proposed daily flow X number of days in release period) (Discharge water concentration – Powder River ambient concentration) (8.34 (mg/l – lb/day conversion factor)

(.22 X 7) (2630 – 1444) (8.34) = 15,232 lbs TDS

(.22 X 7) (1040 – 194) (8.34) = 10,866 lbs Na

The proposed release could not be authorized, Gas X possesses an insufficient dissolved sodium allocation to cover the release.

Questions?